

SEMESTER 5		CM	TD	TP	CI	TE	Total	Coef
PHYSICS 1 (4 ECTS)							63,0	
Mechanics	D. Baumgartner, B. Gomes	10,5			21,0		31,5	1
Wave physics	J. Zallat				31,5		31,5	1
ENGINEERING SCIENCES 1 (4 ECTS)							62,0	
Dynamical systems	H. Omran, F. Nageotte	14,0	5,25	8,0	3,5		30,75	1
Analog Electronics	C. Lallement, N. Dumas	8,75	5,25	12,0	5,25		31,25	1
MATHEMATICS AND COMPUTER SCIENCE 1 (9 ECTS)							119,25	
Probability and stochastic processes	C. Heinrich	12,25	10,5	1,75			24,5	1
Procedural programming	L. Cuvillon, S. Faisan, ...	5,25		28,0	31,5		64,75	2
Numerical tools	Y. Takakura, C. Heinrich			16,0	14,0		30,0	1
LIFE SCIENCES AND HEALTH 1 (7 ECTS)							92,5	
Biology	A.-L. Duchemin, M. Zeniou, ...	7,0		12,0	10,5		29,5	1
Biomechanics	D. Baumgartner, D. George, ...	17,5	3,5		10,5		31,5	1
Anatomy	J.P. Dillenseger, J.S. Raul, A. Walch	31,5					31,5	1
FOREIGN LANGUAGES (3 ECTS)							44,0	
English	CRL		20,0				20,0	N
German, spanish, japanese, or chinese			24,0				24,0	N
ECONOMIC AND SOCIAL SCIENCES (3 ECTS)							29,75	
Interpersonal communication	A. Brouchet, C. Colmerauer	7,0					7,0	-
Sustainable development and corporate social ...	G. Burgart, V. Maioli	10,5	9,25				19,75	R
Engineering knowledge and societal challenges	G. Burgart					3,0	3,0	R
SEMESTER 6		CM	TD	TP	CI	TE	Total	Coef
PHYSICS 2 (7 ECTS)							94,75	
Physics for medical imaging	V. Schuh	8,75		24,0			32,75	1
Photonics	H. Salehi, W. Uhring, A. Nahas	10,5		20,0			30,5	1
Multiphysics simulation	B. Gomes				31,5		31,5	1
ENGINEERING SCIENCES 2 (9 ECTS)							120,75	
Digital electronics	M. Madec, M. Frey, T. Hingre			16,0	14,0		30,0	1
Digital control	F. Nageotte, H. Omran	12,25	5,25	12,0	1,75		31,25	1
Digital design chain	B. Gomes, H. Omran, M. Madec				31,5		31,5	1
Signal Processing	C. Meillier, C. Gontier	14,0	14,0				28,0	1
MATHEMATICS AND COMPUTER SCIENCE 2 (4 ECTS)							62,25	
Object-oriented programming	C. Heinkelé, Q. Colman	12,25		20,0			32,25	1
AI and machine learning	N. Padoy	14,0			16,0		30,0	1
LIFE SCIENCES AND HEALTH 2 (4 ECTS)							61,25	
Digital biomechanics	D. Baumgartner, B. Gomes	7,0			24,5		31,5	1
Quantitative physiology	J. Vappou, C. Habold	29,75					29,75	1
FOREIGN LANGUAGES (3 ECTS)							44,0	
English	CRL		20,0				20,0	N
German, spanish, japanese, or chinese			24,0				24,0	N
ECONOMIC AND SOCIAL SCIENCES (3 ECTS)							38,0	
Career planning	A. Dabrowski, R. Jost	3,5	10,5				14,0	R
Epistemology and construction of knowledge 1	C. Collet	21,0					21,0	R
Engineering knowledge and societal challenges	G. Burgart					3,0	3,0	R

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Option DTMI
Promotion 2028**

SEMESTER 7		CM	TD	TP	CI	TE	Total	Coef
MATHEMATICS AND SIGNAL (5 ECTS)							89,0	
Statistical hypothesis tests	F. Heitz, C. Meillier	5,25	8,0				13,25	1
Artificial intelligence and machine learning	A. Deleforge, H. Drira	12,25		7,5			19,75	2
Signal digital processing	Y. Takakura	10,5	10,5	7,0			28,0	3
Statistical signal processing	F. Heitz, C. Meillier	10,5	10,5	7,0			28,0	3
COMPUTER SCIENCE (5 ECTS)							55,25	
Image and vision software aspects	F. Nageotte, M. Chaari			16,0			16,0	1
Data base	F. Fabian	8,75		12,0			20,75	2
Design of embedded systems using FPGA	F. Dadouche	7,0	3,5	8,0			18,5	1
BIOMECHANICS AND NUMERICAL APPROACH (4 ECTS)							71,25	
Biomechanics and rheology	S. Chatelin	24,5					24,5	1
Finite element methods	B. Gomes, N. Dumas	8,75	3,5	8,0			20,25	1
Numerical biomechanics	D. Baumgartner	10,5			16,0		26,5	1
TECHNOLOGIES AND PHYSICS FOR HEALTHCARE (4 ECTS)							77,5	
Physics of medical imaging	E. Breton, H. Salehi, C. Blondet	10,5	10,5				21,0	1
Physics and photonics	H. Salehi, W. Uhring, A. Nahas	5,25		12,0			17,25	1
Microfluidics and clean room	N. Dumas, D. Funfschilling, ...	8,75		12,0			20,75	1
Microsystems and biosystems	C. Lallement, N. Dumas	8,75	1,75	8,0			18,5	1
PROJECT (5 ECTS)							83,5	
Engineering project 1	H. Salehi					80,0	80,0	1
Git	Q. Bramas				3,5		3,5	-
FOREIGN LANGUAGES (3 ECTS)							42,0	
English	Ruhlmann M., Piotto R.			20,0			20,0	N
German, spanish, japanese, or chinese				22,0			22,0	N
ECONOMIC AND SOCIAL SCIENCES (1 ECTS)							10,25	
Professional networking	F. Prégaldiny	1,75				5,0	6,75	R
Frugal innovation	J. Gangloff	3,5					3,5	R
Engineering knowledge and societal challenges	G. Burgart						3,0	R
INTERNSHIP (3 ECTS)								N
Executing internship								N
SEMESTER 8		CM	TD	TP	CI	TE	Total	Coef
PROJECT (5 ECTS)							80,0	
Engineering project 2	H. Salehi					80,0	80,0	1
BIOLOGY AND HEALTHCARE (6 ECTS)							73,5	
Medical and surgical procedures	D. Baumgartner	17,5					17,5	2
Clinical translation	S. Gioux	8,75					8,75	1
Analysis of biological images	AL. Duchemin	19,25					19,25	2
Image processing	H. Drira, M. Olaoluwa	14,0		14,0			28,0	3
INNOVATIVE MEDICAL DIAGNOSES AND TREATMENTS (14 ECTS)							153,0	
Machine learning	H. Drira				21,0		21,0	1
Biomedical devices and HIS	A. Pellegrino	24,5					24,5	1
Medical image processing	M. Mondino	5,25		6,0			11,25	1
Computer vision	F. Nageotte	16,0					16,0	1
Software tools for robotics	M. Yguel				16,0		16,0	-
Mechatronics and haptics	B. Gomes	10,5	30,0				40,5	3
Optimization	H. Omran	14,0	1,75	8,0			23,75	2
FOREIGN LANGUAGES (3 ECTS)							42,0	
English	Ruhlmann M., Piotto R.			20,0			20,0	N
German, spanish, japanese, or chinese				22,0			22,0	N
ECONOMIC AND SOCIAL SCIENCES (2 ECTS)							22,75	
Financial management	I. Barth	10,5					10,5	1
Team management	C. Poloce	5,25					5,25	R
Career planning		3,5	3,5				7,0	R

		CM	TD	TP	CI	TE	Total	Coef
Engineering knowledge and societal challenges	G. Burgart						2,0	R

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Option TI
Promotion 2028**

SEMESTER 7		CM	TD	TP	CI	TE	Total	Coef
MATHEMATICS AND SIGNAL (5 ECTS)							89,0	
Statistical hypothesis tests	F. Heitz, C. Meillier	5,25	8,0				13,25	1
Artificial intelligence and machine learning	A. Deleforge, H. Drira	12,25		7,5			19,75	2
Signal digital processing	Y. Takakura	10,5	10,5	7,0			28,0	3
Statistical signal processing	F. Heitz, C. Meillier	10,5	10,5	7,0			28,0	3
COMPUTER SCIENCE (5 ECTS)							55,25	
Image and vision software aspects	F. Nageotte			16,0			16,0	1
Data base	F. Fabian	8,75		12,0			20,75	2
Design of embedded systems using FPGA	F. Dadouche	7,0	3,5	8,0			18,5	1
BIOMECHANICS AND NUMERICAL APPROACH (4 ECTS)							71,25	
Biomechanics and rheology	S. Chatelin	24,5					24,5	1
Finite element methods	B. Gomes, N. Dumas	8,75	3,5	8,0			20,25	1
Numerical biomechanics	D. Baumgartner	10,5			16,0		26,5	1
TECHNOLOGIES AND PHYSICS FOR HEALTHCARE (4 ECTS)							77,5	
Physics of medical imaging	E. Breton, H. Salehi	10,5	10,5				21,0	1
Physics and photonics	H. Salehi, W. Uhring, A. Nahas	5,25		12,0			17,25	1
Microfluidics and clean room	N. Dumas, ...	8,75		12,0			20,75	1
Microsystems and biosystems	C. Lallement, N. Dumas	8,75	1,75	8,0			18,5	1
PROJECT (5 ECTS)							83,5	
Engineering project 1	H. Salehi					80,0	80,0	1
Git	Q. Bramas				3,5		3,5	-
FOREIGN LANGUAGES (3 ECTS)							42,0	
English	Ruhlmann M., Piotto R.			20,0			20,0	N
German, spanish, japanese, or chinese				22,0			22,0	N
ECONOMIC AND SOCIAL SCIENCES (1 ECTS)							10,25	
Professional networking	F. Prégaldiny	1,75				5,0	6,75	R
Frugal innovation	J. Gangloff	3,5					3,5	R
Engineering knowledge and societal challenges	G. Burgart						3,0	R
INTERNSHIP (3 ECTS)								N
Executing internship								N
SEMESTER 8		CM	TD	TP	CI	TE	Total	Coef
PROJECT (5 ECTS)							80,0	
Engineering project 2	H. Salehi					80,0	80,0	1
BIOLOGY AND HEALTHCARE (6 ECTS)							73,5	
Medical and surgical procedures	D. Baumgartner	17,5					17,5	2
Clinical translation	S. Gioux	8,75					8,75	1
Analysis of biological images	AL. Duchemin	19,25					19,25	2
Image processing	H. Drira, M. Olaoluwa	14,0		14,0			28,0	3
EMBEDDED ELECTRONICS AND SYSTEMS (6 ECTS)							49,5	
Communication protocols	L. Werling, M. Madec	7,0		4,0			11,0	1
Circuits and systems	N. Dumas			8,0	10,5		18,5	2
Project of design of an embedded system	N. Dumas			20,0			20,0	2
INNOVATIVE THERAPEUTICS (8 ECTS)							84,5	
Analog integrated circuit design	F. Schwartz	10,5		16,0			26,5	2
Nanosciences	O. Ersen	7,0					7,0	1
Circuits and advanced systems and tools	N. Dumas, C. Lallement	3,5		8,0	3,5		15,0	1
Physics of lasers and optical fibers	J. Zallat	12,25					12,25	1
Computational biology	M. Madec, A. L. Duchemin	3,5		8,0			11,5	1
Physics of sensors	C. Lallement	7,0	5,25				12,25	1
FOREIGN LANGUAGES (3 ECTS)							42,0	
English	Ruhlmann M., Piotto R.			20,0			20,0	N
German, spanish, japanese, or chinese				22,0			22,0	N

		CM	TD	TP	CI	TE	Total	Coef
ECONOMIC AND SOCIAL SCIENCES 2 ECTS							22,75	
Financial management	I. Barth	10,5					10,5	1
Team management	C. Poloce	5,25					5,25	R
Career planning		3,5	3,5				7,0	R
Engineering knowledge and societal challenges	G. Burgart						2,0	R

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Option Diagnostics et traitements médicaux innovants
Promotion 2027**

SEMESTER 9

	CM	TD	TP	CI	TE	Total	Coef
MEDICAL IMAGING AND IMAGE PROCESSING (6 ECTS)						77,25	
Inverse problems	Ch. Heinrich	10,5				10,5	1
Advanced medical image processing : modalities and ...	M. Mondino	21,0				21,0	2
Medical imaging technology	V. Schuh, J.-P. Dillenseger	12,25	3,5	11,0		26,75	2
Biomedical acoustics	J. Vappou	15,0			4,0	19,0	2
MEDICAL ROBOTICS (6 ECTS)						90,5	
Robotics	H. Omran, B. Bayle	14,0			12,0	26,0	3
Medical robot vision	F. Nageotte	14,0				14,0	1
Robot registration	F. Nageotte	10,5			12,0	22,5	2
Computer assisted medical interventions	B. Bayle, B. Rosa, L. Rubbert, ...	28,0				28,0	3
MODELING OF LIVING SYSTEMS AND SIMULATION (5 ECTS)						68,75	
Modeling of living systems	D. Baumgartner, B. Gomes	20,0				20,0	2
Modeling of living systems	D. Baumgartner				16,0	16,0	1
Real-time simulation	H. Courtecuisse	8,75			24,0	32,75	3
FOREIGN LANGUAGES (3 ECTS)						40,0	
English	Ruhlmann M., Piotto R.		20,0			20,0	N
German, spanish, japanese, or chinese			20,0			20,0	N
ECONOMIC AND SOCIAL SCIENCES (4 ECTS)						88,0	
Economic intelligence	O. Olivier-Garnier, A. Matoua	12,0				12,0	1
Quality	E. Nguyen-Van-Sang	12,0				12,0	1
Entrepreneurship	M. Cuny	28,0				28,0	R
Intellectual property and patents	P. Borne	16,0				16,0	1
Bioethics	C. Lallement	20,0				20,0	2
INTERNSHIP (6 ECTS)							
Practical internship							N

SEMESTER 10

	CM	TD	TP	CI	TE	Total	Coef
END OF STUDY INTERNSHIP (30 ECTS)							
Defense							6
Report							6
Internship work							18

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Option Thérapeutiques innovantes
Promotion 2027**

SEMESTER 9		CM	TD	TP	CI	TE	Total	Coef
BIOLOGICAL INSTRUMENTATION (4 ECTS)							70,5	
Plasmonics and bioapplications : fundamentals	Y. Takakura, S. Lecler	8,75	3,5	4,0			16,25	1
Plasmonics and bioapplications : design of optical ...	Y. Takakura, N. Dumas	1,75		12,0			13,75	1
Impedance spectroscopy	J. Claudel, C. Lallement	3,5		8,0			11,5	1
Optical instrumentation for biomedical applications	A. Nahas	10,5					10,5	1
Cell, culture and instrumentation	S. Dumont	10,5		8,0			18,5	2
NANOSCIENCES & LAB ON CHIP (3 ECTS)							62,75	
Nanosciences	S. Begin, D. Mertz, O. Ersen	22,5					22,5	1,5
Biochips	C. Lallement, M. Madec, D. Biggio	3,5		16,0			19,5	2
Lab-on-chip	B. Gomes	8,75		12,0			20,75	1,5
BIOLOGICAL ENGINEERING PROJECT (6 ECTS)							100,0	
PharmaTech project	G. Zuber, N. Dumas					100,0	100,0	1
DESIGN OF HETEROGENEOUS INTEGRATED SYSTEMS FOR HEALTH (3 ECTS)							71,0	
Design with microelectronics CAD tools	F. Schwartz			28,0			28,0	1,5
Biosystems modeling	M. Madec	7,0		16,0			23,0	2
High-level conception of systems	J.B. Kammerer	4,0		16,0			20,0	1,5
BIBLIOGRAPHY & CONFERENCES (1 ECTS)							21,0	
Therapeutic innovations : studies and applications	C. Lallement	3,5					3,5	-
Conferences, seminars, visits								-
Biosensors and industrial applications	F. Rufi, K. Assouly	7,0					7,0	-
Neuroscience	S. Hemm	7,0					7,0	-
Synthetic biology	C. Rigouin	3,5					3,5	-
FOREIGN LANGUAGES (3 ECTS)							40,0	
English	Ruhlmann M., Piotto R.			20,0			20,0	N
German, spanish, japanese, or chinese				20,0			20,0	N
ECONOMIC AND SOCIAL SCIENCES (4 ECTS)							88,0	
Economic intelligence	O. Olivier-Garnier, A. Matoua	12,0					12,0	1
Quality	E. Nguyen-Van-Sang	12,0					12,0	1
Entrepreneurship	M. Cuny	28,0					28,0	R
Intellectual property and patents	P. Borne	16,0					16,0	1
Bioethics	C. Lallement	20,0					20,0	2
INTERNSHIP (6 ECTS)								
Practical internship								N
SEMESTER 10		CM	TD	TP	CI	TE	Total	Coef
END OF STUDY INTERNSHIP (30 ECTS)								
Defense								6
Report								6
Internship work								18

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